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IS 12669-1 (1989): Bulk handling equipment - Hydraulic excavator - Data sheet for selection, Part 1: Hoe [MED 7: Material Handling Systems and Equipment]

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IS 12669 (Part 1) : 1989

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Indian Standard

BULK HANDLING EQUIPMENT — HYDRAULIC EXCAVATOR — DATA SHEET FOR SELECTION

PART 1 HOE

भारतीय मानक

राशि संचलन उपस्कर — द्रवचालित खनित्र — चयन के लिए आंकड़ा पत्र

भाग 1 होव

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1990

Price Group 3

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 10 April 1989, after the draft finalized by the Bulk Handling Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard is expected to provide a uniform method of specifying dimensional and other technical requirements for hydraulic excavator with hoe attachment by the manufacturer. It is felt that a uniform method of presenting the data may greatly facilitate the user to select a suitable machine for the job.

Indian Standard

BULK HANDLING EQUIPMENT — HYDRAULIC EXCAVATOR — DATA SHEET FOR SELECTION

PART 1 HOE

1 SCOPE

1.1 This standard covers requirements of data required for selection of hydraulic excavator with hoe attachment and having diesel engine as the prime mover.

1.2 This standard does not apply to barge mounted excavator.

2 REFERENCES

IS No.	*Title*
IS 12192 : 1987	Procedure for determination of volumetric ratings of hydraulic excavator hoe type buckets

3 DATA TO BE SUPPLIED BY THE MANUFACTURER

3.1 The following data shall be supplied by the manufacturer:

a) Name ______

b) Model ______

c) Operating mass of machine (*see* Note 1) ______ kg

d) Bucket capacity according to IS 12192 : 1987 ______ m^3

e) Main dimensions of complete machine shall be as given in Fig. 1.

f) Shipping weight ______

NOTES

1 Operating mass of machine refers to that with a standard boom, stick, bucket, etc.

2 In case machine is offered with different combination of boom and arms, the dimensions of basic machine without attachment shall be given and these shall also be given for the machine with different attachments to help transportation personnel. It shall, however, be ensured that under the worst operating conditions, the stability of machine shall not be less than one.

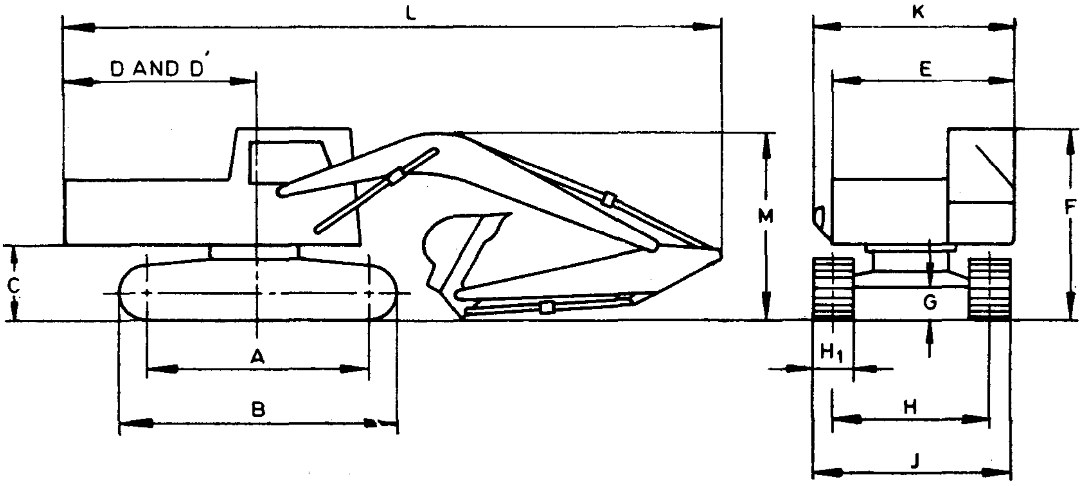
4 DETAILS OF SUB-SYSTEMS

4.1 Power Unit (Diesel Engine)

a) Make and model ______

b) Type ______ Inline/V-type; Two stroke/Four stroke

c) Cooling system ______ Air cooled/ Water cooled



A = distance between tumblers
B = undercarriage length
C = counterweight clearance
D′ = rear-end length
D = rear-end swing radius
E = overall width of superstructure
F = overall height of cab
G = minimum ground clearance
H = track gauge
H_1 = track shoe width
J = undercarriage width
K = overall width
L = overall length
M = overall height of boom

FIG. 1 MAIN DIMENSIONS OF BACK HOE

d) Gross power ______ kW at ______ rev/min

e) Flywheel power ____ kW at ________ rev/min

f) Maximum torque _____ Nm at ______ rev/min

g) Specific fuel consumption (SFC) (SFC curve to be provided at rated load and speed) ____________________ g/kWh

h) Nature of aspiration ____________ Natural/ Supercharged/Turbo-charged/Any other

j) Number of cylinders __________________

k) Bore (mm) × stroke (mm) ____________

m) Displacement __________________ litres

n) Type of fuel used __________________

p) Type of fuel pump __________________

q) Air cleaner type __________________

r) Air filteration system: Type ______ Dry/Wet

s) Air cleaner service indicator ____________ Provided/Not provided

t) Net weight (dry) __________________ kg

u) Type of governing __________________

v) Derating factor __________________

w) Position of engine ________________ Front/ Rear/Centre

x) Starting system __________________

y) Electrical system voltage ______________ V

NOTE — In case of super-charged and turbo-charged engines, derating factor shall be specified by the manufacturer.

4.2 Hydraulic System

4.2.1 *Hydraulic Pumps*

a) Number and type of main pumps ________

b) Maximum flow of main pumps __________

c) Number and type of auxiliary pumps _____

d) Maximum flow of auxiliary pumps ______

4.2.2 *Hydraulic Cylinders*

	Quantity	*Bore* × *Rod Dia* × *Stroke* (mm)
Boom		
Arm		
Bucket		

4.2.3 *Hydraulic Tank* __________________

Pressurized/Non-pressurized/Partially pressurized

4.2.4 *Relief Valve Settings*

a) Main relief valve __________________

b) Secondary/overload relief valves _________

c) Boom circuit __________________

d) Arm circuit __________________

e) Bucket circuit __________________

f) Swing circuit __________________

g) Travel circuit __________________

4.2.5 *Hydraulic Filters (Filtering Quality and Numbers)*

a) Type (paper, wire mesh, etc) __________

b) Filtering quality (μ) ______________

c) Number of filters __________________

4.3 Controls

a) Type (mechanical, pilot operated, etc) _____

If pilot operated, type of pilot operation _____ Hydraulic/Electrical/Other (specify)

b) Number of control levers ____________

c) Actuation diagram/details (*see* Fig. 2) __________________

4.4 Superstructure

a) Swing mechanism __________________

b) Motor type __________________

c) Gear box type __________________

d) Slew bearing type __________________

e) Slew speed __________________ rev/min

f) Swing lock type __________________

g) Braking system of motor
  1) Number __________________
  2) Type __________________

4.5 Operation Cab

Brief description of cab, glass windows, operator's seat, rock guard, etc, shall be given.

4.6 Undercarriage

Brief description of style of track frames — welded or bolted, etc, track chain, rollers, shoes, etc, shall be given.

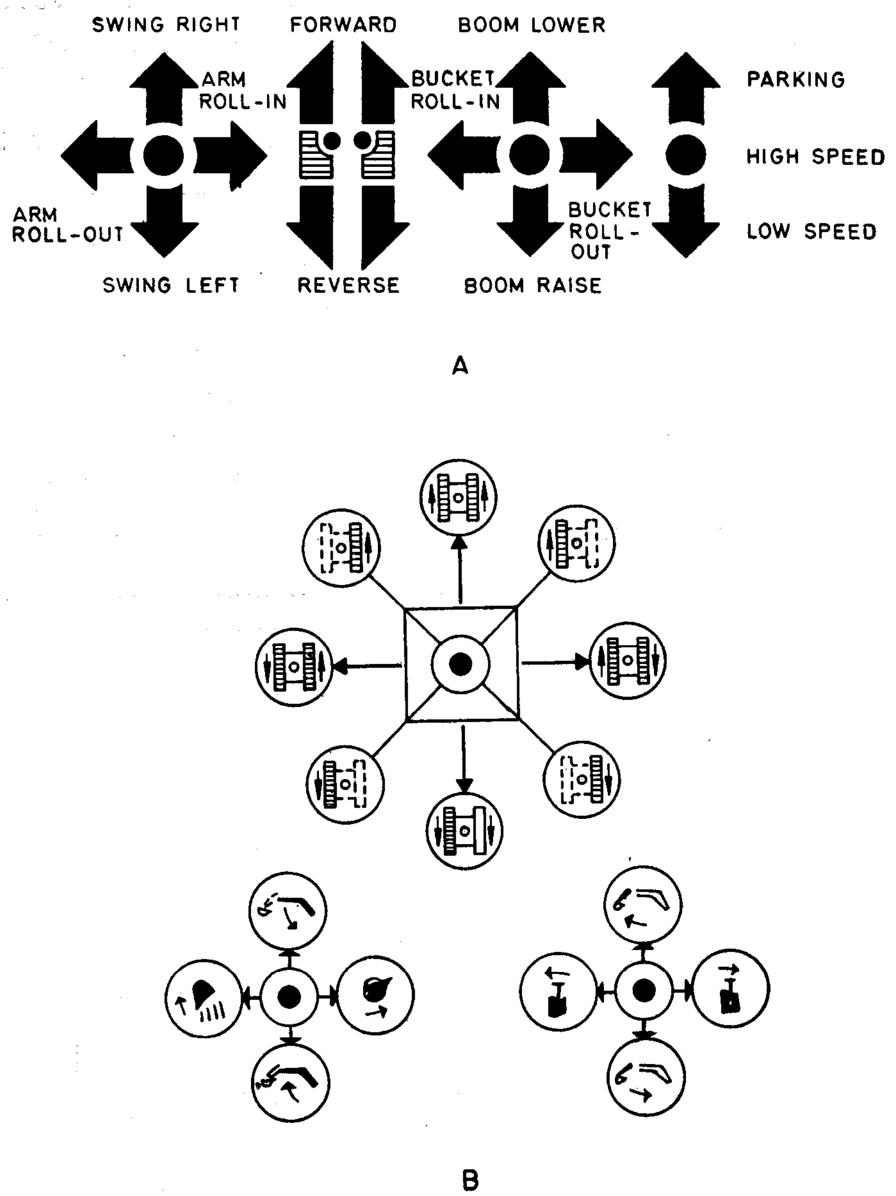


Fig. 2 Typical Actuation Diagrams

4.6.1 Following information shall also be given:

a) Type of shoe____________________

b) Shoe width and their number____________

c) Number of lower rollers____________

d) Number of upper rollers____________

e) Ground pressure ________________ kPa

4.7 Traction

a) Type of propel motor, gear box and braking ____________________

b) Maximum tractive effort____________ kN

c) Gradeability (continuous)
  1) Percent ____________________
  2) Degrees ____________________

d) Travel speed (km/h)
  1) High____________________
  2) Low ____________________

5 ATTACHMENT

a) Length of booms, arm________________

b) Digging forces (maximum radial force at tooth) with bucket cylinder and with arm cylinder for different arm/boom combinations ______________________

c) Type of booms ____________ One piece/ Adjustable two piece/Other (specify)

5.1 Bucket

a) Capacity as in IS 12192 : 1987 ________ m^3

b) Width ______________________

c) Weight ______________________

d) Recommendation (namely, suitability for different arm/boom and material to be dug) ______________________

e) Teeth ____________ Fixed/Replaceable

6 MASS AND GROUND PRESSURE

6.1 Operating mass and ground pressure with different combinations of arms/buckets/shoes, etc, shall be given.

7 SERVICE REFILL CAPACITIES (*l*)

a) Fuel tank ______________________

b) Hydraulic oil tank ______________________

c) Hydraulic oil system ______________________

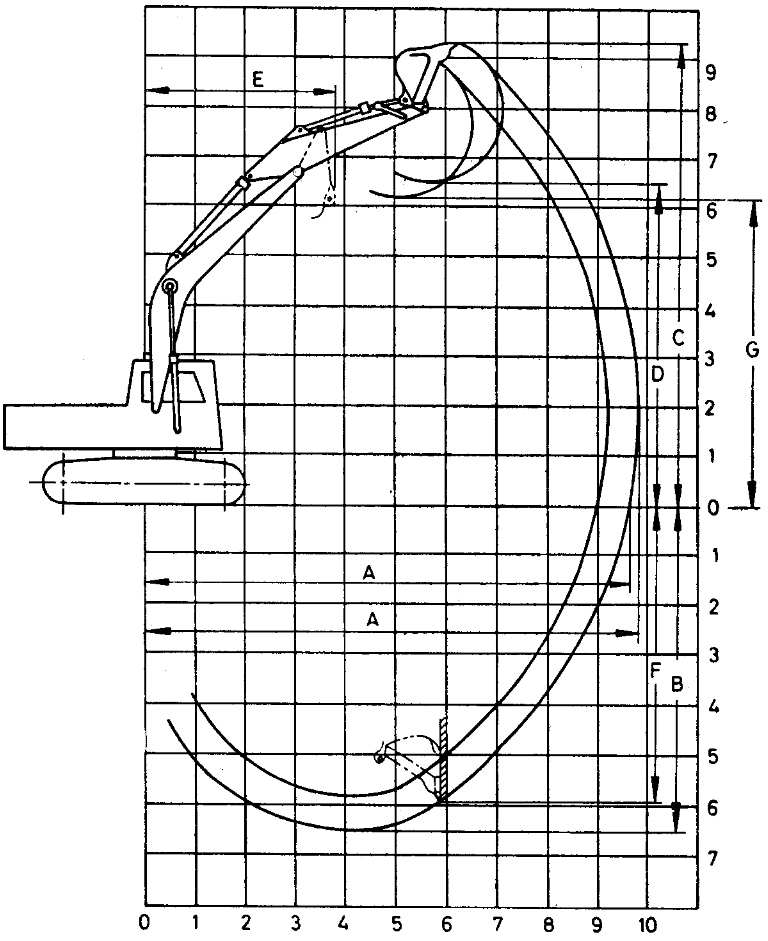
d) Engine oil ______________________

e) Different gear boxes ______________________

f) Coolant capacity ______________________

8 WORKING RANGE

8.1 Complete range diagram of machine with different arm/boom, etc, combination shall be given, similar to that illustrated in Fig. 3.



A = maximum digging reach
A' = maximum digging reach (on ground)
B = maximum digging depth
C = maximum cutting height
D = maximum dumping height
E = maximum swing radius
F = maximum vertical wall
G = vertical height at minimum swing radius

FIG. 3 TYPICAL DIAGRAM OF WORKING RANGES

9 LIFTING CAPACITIES

In case, back hoe is to be allowed for lifting purposes, such as, pipe laying, the maximum safe lifting capacity with different arm/boom combination for different operating radii, swing position and basis shall be given. The information may be given with bucket and without bucket as illustrated in Table 1.

10 WHEEL MOUNTED BACK HOE

10.1 In case of wheel mounted back hoe, the following information shall be given:

a) Number of wheels and axles and driven axles ____________________

b) Tyre sizes ____________________

c) Tyre pressure ____________________

d) Number of speeds and type of drive (for example, individual wheels driven/crown wheel/pinion driven) ____________________

e) Type of out riggers ____________________

f) Maximum travel speed ____________________

g) Maximum traction force ____________________

h) Gradeability (percent) ____________________

j) Steering system (linkage/hydraulic assisted/ hydraulic) ____________________

k) Minimum turning radius ____________________

10.2 Dimensional Details

In addition to main dimensional details as in **3.1**(e), dimensional details with a sketch shall be given to replace the crawler mounted sketch in case of wheel mounted back hoe.

10.3 Following details shall also be given:

a) Carrier frame specification

b) Wheel base

c) Width

d) Type of axle — Front : Floating/rigid
Rear : Floating/rigid

e) Degree of axle oscillation

Table 1 Lifting Capacities

(*Clause* 9)

Lift Point Height, mm	**Lift Radius, mm**					**Minimum Radius Lift Capacity**
	Rated lift capacity over end, kg					
	r_1	r_2	r_3	r_4	... r_n	
$+h_n$						
ground						
$-h_n$						
	Rated lift capacity over side, kg					
$+h_n$						
ground						
$-h_n$						

11 SAFETY

11.1 Following shall be provided and information given for:

a) Swing lock for use during transportation

b) Air horn

c) Back-up alarm

d) Cat walk non-stop steps and handrails

e) Headguard

12 OPTIONAL/SPECIAL ATTACHMENTS/ ANY OTHER FEATURES

12.1 When required by the purchaser, optional/ special attachments/any other features shall be provided and for these, information shall be given.

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